

CLAIMS

WE CLAIM:

1. A transgenic plant cell transformed with a nucleic acid encoding a polypeptide, wherein the polypeptide is defined in SEQ ID NO:8.
2. The transgenic plant cell of Claim 1, wherein the nucleic acid comprises a polynucleotide as defined in SEQ ID NO:5.
3. A transgenic plant cell transformed with a nucleic acid encoding a polypeptide, wherein expression of the polypeptide in the plant cell results in the plant cell's increased tolerance to an environmental stress selected from one or more of the group consisting of drought and temperature less than or equal to 0°C, as compared to a wild type variety of the plant cell; wherein the nucleic acid hybridizes under stringent conditions to at least one sequence from the group consisting of a sequence of SEQ ID NO:5 and the full-length complement of the sequence of SEQ ID NO:5; and wherein the stringent conditions comprise hybridization in a 6X sodium chloride/sodium citrate (SSC) solution at 65°C and at least one wash in a 0.2X SSC, 0.1% SDS solution at 50°C.
4. A transgenic plant cell transformed with a nucleic acid encoding a polypeptide having at least 90% sequence identity with a polypeptide as defined in SEQ ID NO:8, wherein expression of the polypeptide in the plant cell results in the plant cell's increased tolerance to an environmental stress selected from one or more of the group consisting of drought and temperature less than or equal to 0°C, as compared to a wild type variety of the plant cell.
5. The transgenic plant cell of any of Claims 1, 2, 3, or 4, wherein the plant is a monocot.
6. The transgenic plant cell of any of Claims 1, 2, 3, or 4, wherein the plant is a dicot.
7. The transgenic plant cell of any of Claims 1, 2, 3, or 4, wherein the plant is selected from the group consisting of maize, wheat, rye, oat, triticale, rice, barley, soybean, peanut, cotton, rapeseed, canola, manihot, pepper, sunflower, tagetes, solanaceous plants, potato,

tobacco, eggplant, tomato, Vicia species, pea, alfalfa, coffee, cacao, tea, Salix species, oil palm, coconut, and perennial grass.

8. A transgenic plant comprising the transgenic plant cell according to any one of Claims 1, 2, 3, or 4.

9. A seed comprising the transgenic plant cell according to any one of Claims 1, 2, 3, or 4.

10. A seed produced by a transgenic plant comprising a plant cell according to any of Claims 1, 2, 3, or 4, wherein the seed comprises the nucleic acid encoding the polypeptide, wherein the seed is true breeding for an increased tolerance to an environmental stress as compared to a wild type variety of the plant cell, and wherein the environmental stress is selected from one or more of the group consisting of drought and temperature less than or equal to 0°C.

11. An isolated nucleic acid encoding a polypeptide, wherein the nucleic acid comprises a polynucleotide that encodes the polypeptide as defined in SEQ ID NO:8.

12. The nucleic acid of Claim 11, wherein the nucleic acid comprises the polynucleotide as defined in SEQ ID NO:5.

13. An isolated nucleic acid encoding a polypeptide, wherein expression of the polypeptide in the plant cell results in the plant cell's increased tolerance to an environmental stress selected from one or more of the group consisting of drought and temperature less than or equal to 0°C, as compared to a wild type variety of the plant cell; wherein the nucleic acid hybridizes under stringent conditions to at least one sequence from the group consisting of a sequence of SEQ ID NO:5 and the full-length complement of the sequence of SEQ ID NO:5; and wherein the stringent conditions comprise hybridization in a 6X sodium chloride/sodium citrate (SSC) solution at 65°C and at least one wash in a 0.2X SSC, 0.1% SDS solution at 50°C.

14. An isolated nucleic acid encoding a polypeptide having at least 90% sequence identity with a polypeptide as defined in SEQ ID NO:8, wherein expression of the polypeptide in the

plant cell results in the plant cell's increased tolerance to an environmental stress selected from one or more of the group consisting of drought and temperature less than or equal to 0°C, as compared to a wild type variety of the plant cell.

15. A seed comprising the isolated nucleic acid according to any one of Claims 11, 12, 13, or 14.

16. An isolated recombinant expression vector comprising a nucleic acid of any one of Claims 11, 12, 13, or 14, wherein expression of the polypeptide in a plant cell results in the plant cell's increased tolerance to an environmental stress as compared to a wild type variety of the plant cell, and wherein the environmental stress is selected from one or more of the group consisting of drought and temperature less than or equal to 0°C.

17. A method of producing a transgenic plant comprising a nucleic acid encoding a polypeptide, comprising,

- a. transforming a plant cell with the expression vector of Claim 16; and
- b. generating from the plant cell a transgenic plant that expresses the polypeptide;

wherein the polypeptide is defined in SEQ ID NO:8.

18. The method of Claim 17, wherein the expression vector comprises the polynucleotide as defined in SEQ ID NO:5.

19. A method of producing a transgenic plant comprising a nucleic acid encoding a polypeptide, wherein expression of the polypeptide in the plant results in the plant's increased tolerance to an environmental stress as compared to a wild type variety of the plant, comprising,

- a. transforming a plant cell with the expression vector of Claim 16; and
- b. generating from the plant cell a transgenic plant that expresses the polypeptide;

wherein the nucleic acid hybridizes under stringent conditions to at least one sequence from the group consisting of a sequence of SEQ ID NO:5 and the full-length complement of the sequence of SEQ ID NO:5; wherein the stringent conditions comprise hybridization in a 6X sodium chloride/sodium citrate (SSC) solution at 65°C and at least one wash in a 0.2X SSC, 0.1% SDS solution at 50°C; and wherein the environmental stress is selected from one or more of the group consisting of drought and temperature less than or equal to 0°C.

20. A method of producing a transgenic plant comprising a nucleic acid encoding a polypeptide, wherein expression of the polypeptide in the plant results in the plant's increased tolerance to an environmental stress as compared to a wild type variety of the plant, comprising,

a. transforming a plant cell with the expression vector of Claim 16; and

b. generating from the plant cell a transgenic plant that expresses the polypeptide;

wherein the polypeptide has at least 90% sequence identity with the polypeptide as defined in SEQ ID NO:5, and wherein the environmental stress is selected from one or more of the group consisting of drought and temperature less than or equal to 0°C.